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IS 11503 (1985): Slates writing school [CHD 14: Printing, Inks, Stationary and Allied Products]



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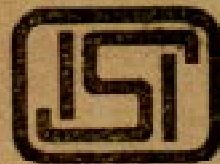
“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
SPECIFICATION FOR
SLATES, WRITING, SCHOOL

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Indian Standard

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Indian Standard

SPECIFICATION FOR SLATES, WRITING, SCHOOL

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 26 December 1985, after the draft finalized by the Pencils Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

0.2 In the preparation of this standard, due weightage has been given to the proper type of material to be used and prevalent trade practices being followed by the manufacturers in this field. Though the users are free to have the sizes and dimensions of their choice, minimum and maximum sizes have been included for their guidance.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers requirements for writing slates made of metal, strawboard or stone, intended for use by students.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Frame — A border surrounding or attached to a slate to protect its edges.

2.2 Slate — Flat surface used for writing purpose with chalk or soft stone pencil.

2.3 Strawboard — Board made from partially cooked straw, grass, bagasse or other agricultural residues or mixture of these.

*Rules for rounding off numerical values (*revised*).

3. NOMENCLATURE

3.1 The nomenclature of various parts of the slate shall be as shown in Fig. 1.

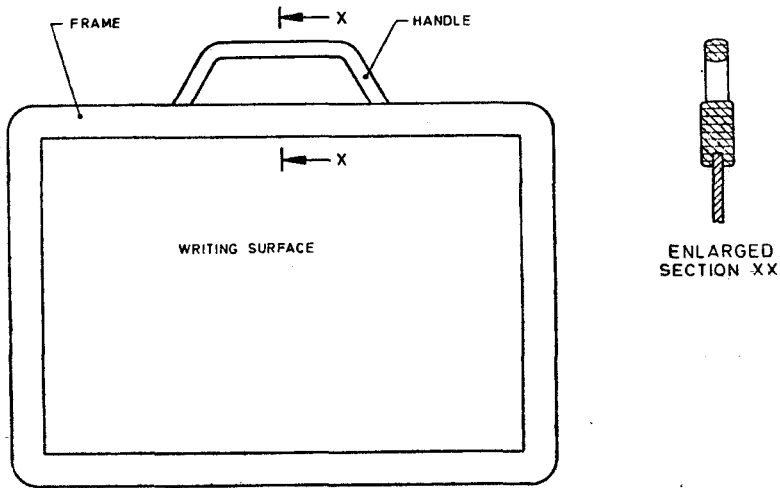


FIG. 1 NOMENCLATURE

4. TYPES

4.1 The slates shall be of the following types:

- Type 1 Metal slate,
- Type 2 Strawboard slate, and
- Type 3 Stone slate.

5. MATERIALS

5.1 Slate

5.1.1 Type 1 slates shall be manufactured from steel sheet. The thickness of the sheet used shall be not less than 0.3 mm.

5.1.1.1 The sheet used shall be of uniform thickness and shall be flat.

5.1.2 Type 2 slates shall be manufactured from strawboard of minimum substance 275 g/m^2 and minimum thickness 3.0 mm.

5.1.3 Type 3 slates shall be manufactured from slate of uniform colour and texture, free from veins, cracks, fissures, white patches and deleterious minerals. The slate used shall be of reasonably straight cleavage and the grains on it shall be longitudinal and not transverse.

5.2 Coating Material — The coating material used for Type 1 and Type 2 slates shall be non-toxic and shall not contain any material injurious to health.

5.3 Frame — The frame shall be of a moulded plastics material or wood.

5.3.1 When of moulded plastics, the material shall be sufficiently non-fragile.

5.3.2 When made of wood, the timber used for framing shall be one of those listed in Appendix A. The timber shall be seasoned to a moisture content between 12 to 15 percent and shall be free from splits, knots, decay and other surface defects

6. DIMENSIONS

6.1 The size of the slates, denoted by the dimensions in millimetres inside the frame, shall be as agreed to between the purchaser and the supplier. The smallest and the largest permissible sizes shall, however, be $150 \times 100 \text{ mm}$ and $280 \times 180 \text{ mm}$ respectively.

6.1.1 The tolerance on the declared size shall be $\pm 5 \text{ mm}$ for each dimension.

6.2 The width and thickness of the plastic frame shall be not less than 10 mm and 5 mm respectively.

6.3 The width and thickness of the wooden frame shall be not less than 20 mm and 8 mm respectively.

7. WORKMANSHIP AND FINISH

7.1 The colour of the writing surfaces of the slate shall be black or grey, as agreed to between the purchaser and the supplier, and shall be reasonably uniform throughout the entire surface.

7.2 The surfaces of the slate shall be such that the texture over the entire writing surface is even and suitable for the purpose so as to enable the slate pencil to make a legible mark during writing. The writing so made shall not leave any impression when wiped off with wet muslin.

7.3 The frame shall fit uniformly and tightly around the length and breadth of the slate.

7.4 The surfaces of the plastic frame shall be smooth or textured as agreed to between the purchaser and the supplier. The surfaces of the wooden frame shall be finished reasonably smooth. The corners and edges in the frame shall be rounded. The joints in the wooden frame shall be glued. The fasteners at the joints shall not project outside the surface of the frame.

7.5 The handle, if provided according to agreement between the purchaser and the supplier, shall be smooth and free from sharp edges.

8. TESTS

8.1 Colour Fastness Test — Each surface of the writing slates of Type 1 and Type 2 shall be rubbed 25 times at the same place with a wet piece of muslin under normal pressure. The wet cloth shall not get blackened and also there shall not be any patches produced on the surface of the slate.

8.2 Test for Transverse Strength — The slates of Type 1 and Type 2, when tested as described in Appendix B, shall not show any damage.

8.3 Test for Resistance to Impact — The slates of Type 1 and Type 2, when tested as described in Appendix C, shall not show any chipping or indentation.

8.4 Water Absorption Test — The slates of Type 2, when tested as described in Appendix D, shall not absorb water more than 2 g/m^2 of the writing surface.

8.5 Test for Frame Strength — The slates of Type 1 and Type 2 shall be allowed to fall from a height of 1 m on to a concrete floor horizontally for 25 times. The frame or the slate shall not show any damage or crack after the test.

9. SAMPLING

9.1 Sampling procedure and acceptance criteria for the slates shall be as agreed to between the purchaser and the supplier. However, a recommended scheme for the same is given in Appendix E.

10. MARKING

10.1 Each writing slate shall be marked with the following:

- a) Manufacturer's name or trade-mark,
- b) Type,

- c) Size, and
- d) Batch No. or Code No.

10.1.1 The slates may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

11. PACKING

11.1 The writing slates shall be so packed as to ensure safe transportation. They may also be packed as agreed to between the purchaser and the supplier.

A P P E N D I X A

(Clause 5.3.2)

TIMBERS FOR FRAME

<i>Trade Name</i>	<i>Botanical Name</i>
Bahera	<i>Terminalia bellirica</i> Roxb.
Fir	<i>Abies</i> spp. (other than <i>Abies Densa</i>)
Gamari	<i>Gmelina arborea</i> Roxb.
Gardenia	<i>Gardenia</i> spp.
Gauri	<i>Polyalthia fragrans</i>
Gutel	<i>Trewia nudiflora</i> Linn.
Haldu	<i>Adina cordifolia</i> Hook. f.
Indra jau	<i>Holarrhena antidysenterica</i> Wall.
Jhingan	<i>Lannea grandis</i> Linn.
Kaim	<i>Mitragyna parvifolia</i> Korth.
Kanju	<i>Holoptelea integrifolia</i> Planch.

<i>Trade Name</i>	<i>Botanical Name</i>
Karar	<i>Sterculia urens</i> Roxb.
Kathal	<i>Artocarpus integrifolius</i> auct. non Linn. f.
Machilus	<i>Machilus</i> spp.
Mango	<i>Mangifera</i> spp.
Pula	<i>Kydia calycina</i> Roxb.
Salai	<i>Boswellia serrata</i> Roxb.
Satinwood	<i>Chloroxylon swietenia</i> DC.
Semul	<i>Bombax ceiba</i> Linn.
Silver oak	<i>Grevillea robusta</i> A. Cunn.
Teak	<i>Tactona grandis</i> Linn. f.
White cedar	<i>Dysoxylum malabaricum</i> Bedd.

APPENDIX B

(Clause 8.2)

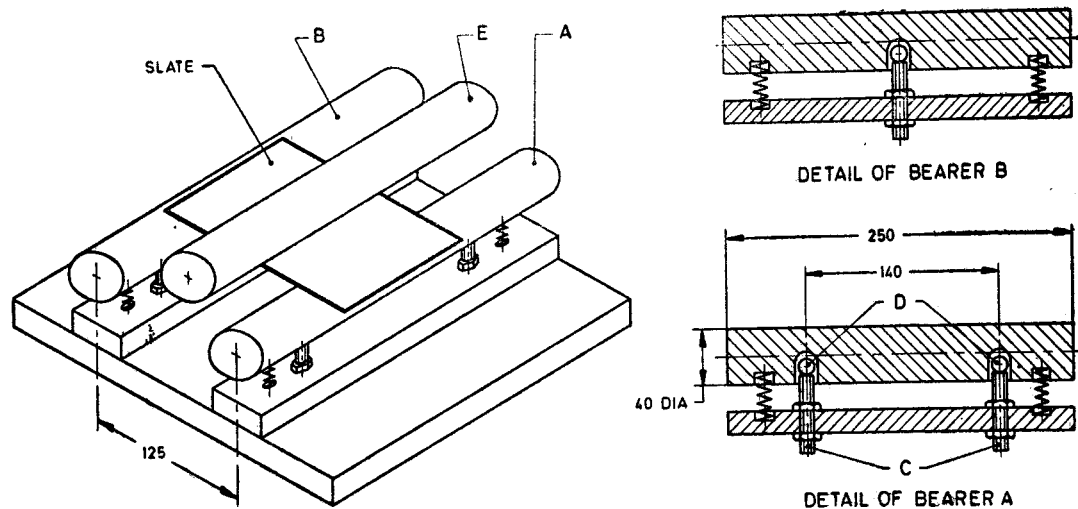
TEST FOR TRANSVERSE STRENGTH

B-1. APPARATUS

B-1.1 The apparatus for this test shall consist of self-aligning bearers *A* and *B*, each of length 250 mm (see Fig. 2). Bearer *A* shall be supported horizontally on brass screws *C* which carry hardened steel balls *D* concentric with the bearer. Bearer *B* shall be supported on one such bearer screw and ball. The bearers *A*, *B* and *E* shall be of mild steel and of 40 mm diameter. The bearers *A* and *B* shall be provided with two springs which shall hold them in position. The bearers *A* and *B* shall be in the same horizontal plane, parallel to each other and to bearer *E*. The distance between bearers *A* and *B* at the points of contact with the test specimen shall be 125 mm. Bearer *E* shall be midway between bearers *A* and *B* and shall rest on the upper surface of the test specimen.

B-2. PROCEDURE

B-2.1 The frame of the slate is removed and the slate placed on the self-aligning bearers *A* and *B*. The bearer *E* is then positioned. A load of 20 N is applied through the bearer *E* for 30 seconds. The slate is observed for any damage.



All dimensions in millimetres.

FIG. 2 A TYPICAL TRANSVERSE STRENGTH TEST ASSEMBLY

APPENDIX C

(Clause 8.3)

TEST FOR RESISTANCE TO IMPACT

C-1. APPARATUS

C-1.1 Mild steel ball of mass 30 ± 1 g.

C-2. PROCEDURE

C-2.1 The slate is fixed in a vertical plane by means of clamps. The ball is suspended 500 mm from the centre of the slate at a point A directly above the slate, lying in the same plane as the slate. The ball is brought 300 mm away from the plane of the slate as shown in Fig. 3 and released gently. The slate is observed for any chipping or indentation.

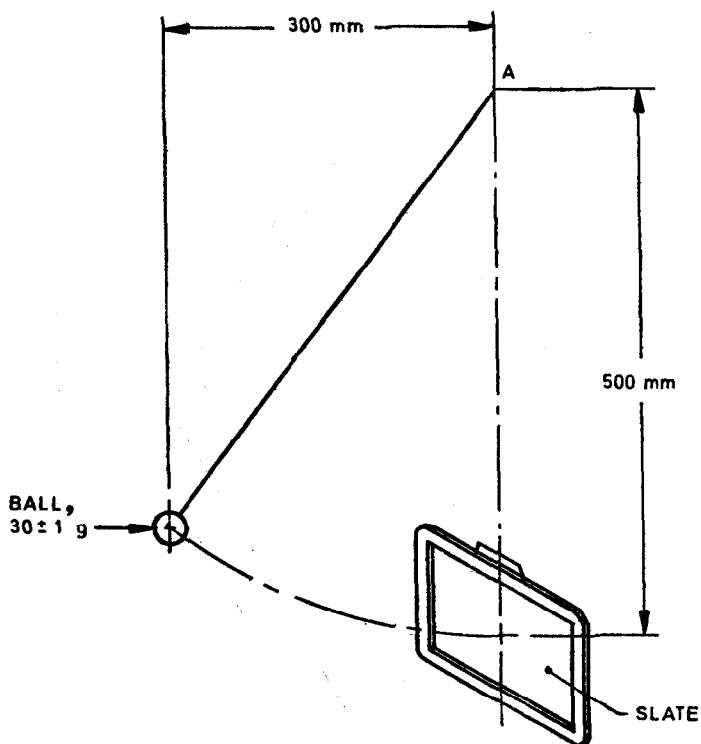


FIG. 3 IMPACT TEST ARRANGEMENT

APPENDIX D*(Clause 8.4)***WATER ABSORPTION TEST****D-1. APPARATUS AND MATERIALS**

D-1.1 Apparatus for Dipping — Any type of apparatus which permits the following may be used :

- a) An immediate and uniform contact of water with the test piece, and
- b) A rapid withdrawal of the test piece.

D-1.1.1 The material of construction of the apparatus shall be such that it is not affected by water.

D-1.2 Stop Watch

D-1.3 Balance — Accurate to 1 mg.

D-1.4 Distilled Water — At room temperature.

D-2. PROCEDURE

D-2.1 The frame of the slate is removed. The edges of the slate are treated suitably as to make them resist absorption of water. The slate is weighed to the nearest milligram. It is then put horizontally into the reservoir of the apparatus for dipping containing water to a height of approximately 5 cm, the stop watch being started immediately. After 1 minute, the slate is withdrawn and allowed to dry vertically under fan for 10 minutes. The slate is then weighed again and the water absorbed in grams per square metre of the writing surface calculated.

APPENDIX E*(Clause 9.1)***SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR SLATES, WRITING, SCHOOL****E-1. LOT**

E-1.1 In any consignment, the slates of the same size and type and manufactured from the same raw materials under similar conditions shall be grouped together to constitute a lot.

E-2. SAMPLING

E-2.1 For ascertaining the conformity of a lot to the requirements of this

standard, samples of slates shall be selected and tested separately from each lot.

E-2.2 The number of slates to be selected from each lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 SAMPLE SIZE AND ACCEPTANCE NUMBER

(Clauses E-2.2, E-3.1 and E-3.2)

LOT Size	SAMPLE Size	ACCEPTANCE NUMBER	SUB-SAMPLE Size
(1)	(2)	(3)	(4)
Up to 50	5	0	1
51 to 100	5	0	1
101 to 150	8	1	2
151 to 300	13	1	2
301 to 500	20	2	3
501 to 1 000	32	3	4
1 001 and above	50	5	5

E-2.2.1 These slates shall be selected from the lot at random and in order to ensure randomness of selection, IS : 4905-1968* may be used.

E-3. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

E-3.1 The sample slates selected according to col 1 and 2 of Table 1 shall be examined for visual characteristics of materials (5), dimensions (6) and workmanship and finish (7). Any slate failing to meet one or more of these requirements shall be termed defective. The number of defective slates found in the sample shall not exceed the acceptance number given in col 3 of Table 1 if the lot is to be accepted under this clause.

E-3.2 In the case of Type 1 and Type 2 slates, the lot found satisfactory under **E-3.1**, shall undergo further tests. The sub-sample size for these tests is given in col 4 of Table 1. The slates in the sub-sample shall be randomly selected from the original sample. Each of the slates in the sub-sample shall undergo tests for colour fastness (for Types 1 and 2) (8.1), transverse strength (for Types 1 and 2) (8.2), resistance to impact (for Types 1 and 2) (8.3), water absorption (for Type 2) (8.4) and frame strength (for Types 1 and 2) (8.5). More samples may be drawn, if required, to achieve the minimum sub-sample size (col 4 of Table 1) for each of the above tests. No failure shall occur if the lot is to be accepted under this clause.

*Methods for random sampling.